

**WHAT IS CLAIMED IS:**

1. A compound comprising the formula:

5 (I)  $Z_1-X_1-X_2-X_3-X_4-X_5-X_6-X_7-X_8-X_9-X_{10}-X_{11}-X_{12}-X_{13}-X_{14}-X_{15}-X_{16}-X_{17}-Z_2$

wherein:

$X_1$  is an apolar residue;

$X_2$  is a hydrophobic residue;

10  $X_3$  is an acidic or an aliphatic residue;

$X_4$  is a basic residue;

$X_5$  is an apolar residue;

$X_6$  is an aromatic residue;

$X_7$  is a polar residue;

15  $X_8$  is an aliphatic residue;

$X_9$  is an acidic or an aliphatic residue;

$X_{10}$  is an aromatic residue;

$X_{11}$  is an aromatic residue;

$X_{12}$  is a polar residue;

20  $X_{13}$  is Ile;

$X_{14}$  is an apolar residue;

$X_{15}$  is an acidic residue;

$X_{16}$  is a polar residue;

$X_{17}$  is a basic or an aliphatic residue;

25  $Z_1$  is  $H_2N-$ ,  $RHN-$  or,  $RRN-$ ;

$Z_2$  is  $-C(O)R$ ,  $-C(O)OR$ ,  $-C(O)NHR$ ,  $-C(O)NRR$  where each R is independently  $(C_1-C_6)$  alkyl,  $(C_1-C_6)$  alkenyl,  $(C_1-C_6)$  alkynyl, substituted  $(C_1-C_6)$  alkyl, substituted  $(C_1-C_6)$  alkenyl or substituted  $(C_1-C_6)$  alkynyl, and

" " is a covalent linkage

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2. The compound of Claim 1, wherein:

$X_1$  is an apolar amino acid;

$X_2$  is an aromatic amino acid;

$X_3$  is an acidic amino acid;

35  $X_4$  is a basic amino acid;

X<sub>5</sub> is an apolar amino acid;  
 X<sub>6</sub> is an aromatic amino acid;  
 X<sub>7</sub> is a polar amino acid;  
 X<sub>8</sub> is a aliphatic amino acid;  
 5 X<sub>9</sub> is a an acidic amino acid;  
 X<sub>10</sub> is an aromatic amino acid;  
 X<sub>11</sub> is an aromatic amino acid;  
 X<sub>12</sub> is a polar amino acid;  
 X<sub>13</sub> is Ile;  
 10 X<sub>14</sub> is an apolar amino acid;  
 X<sub>15</sub> is an acidic amino acid;  
 X<sub>16</sub> is a polar amino acid;  
 X<sub>17</sub> is a basic amino acid; and  
 "—" is an amide, substituted amide or an isostere of amide thereof.  
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3 The compound of Claim 2, wherein:  
 X<sub>1</sub> is Gly;  
 X<sub>2</sub> is Trp or Ala;  
 X<sub>3</sub> is Asp or Ala;  
 20 X<sub>4</sub> is His;  
 X<sub>5</sub> is Met;  
 X<sub>6</sub> is Phe;  
 X<sub>7</sub> is Thr;  
 X<sub>8</sub> is Val;  
 25 X<sub>9</sub> is Asp or Ala;  
 X<sub>10</sub> is Phe;  
 X<sub>11</sub> is Trp;  
 X<sub>12</sub> is Thr;  
 X<sub>13</sub> is Ile;  
 30 X<sub>14</sub> is Met;  
 X<sub>15</sub> is Glu;  
 X<sub>16</sub> is Asn; and  
 X<sub>17</sub> is His or Ala.  
 Z1 is H<sub>2</sub>N;  
 35 Z2 is -C(O)OH; and

"—" is an amide linkage.

4. The compound of Claim 3, wherein said compound is selected from the group consisting of SEQ ID NOS. 1-6.

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5. A pharmaceutical composition comprising the compound of Claim 1 and a pharmaceutical excipient carrier or an excipient.

6. A pharmaceutical composition comprising the compound of Claim 2 and a  
10 pharmaceutical excipient carrier or an excipient.

7. A pharmaceutical composition comprising the compound of Claim 3 and a pharmaceutical excipient carrier or an excipient.

8. A method of inhibiting TfR binding to transferrin, comprising administering  
15 to a subject a therapeutically effective amount of the compound of Claim 1.

9. A method of inhibiting TfR binding to transferrin, comprising administering  
to a subject a therapeutically effective amount of the compound of Claim 2.

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10. A method of inhibiting TfR binding to transferrin, comprising administering  
to a subject a therapeutically effective amount of the compound of Claim 3.

11. A method of treating an iron overload disease, comprising administering to a  
25 subject a therapeutically effective amount of the compound of Claim 1.

12. A method of treating an iron overload disease, comprising administering to a  
subject a therapeutically effective amount of the compound of Claim 2.

13. A method of treating an iron overload disease, comprising administering to a  
30 subject a therapeutically effective amount of the compound of Claim 3.

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